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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FABIENNE PEYAUD, JEANPHILIPPE GOUX, DAVID VEILLON, and FREDERIC BRISSET

Appeal 2015-004637
Application 13/003,942
Technology Center 3700

Before JENNIFER D. BAHR, JAMES P. CALVE, and SEAN P. O'HANLON, *Administrative Patent Judges*.

CALVE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the final rejection of claims 1 and 4. Appeal Br. 1. Claims 2, 3, 5–12, 16, 17, 20, 26, 28, 30, and 33–36 are canceled. *Id.* Claims 13–15, 18, 19, 21–25, 27, 29, 31, and 32 are withdrawn. *Id.* We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

Claim 1, the sole independent claim on appeal, is reproduced below.

1. A refrigeration system comprising:
a compressor having a suction and a discharge;
a heat rejecting heat exchanger;
an expansion valve;
a heat accepting heat exchanger;
a pressure equalization valve for equalizing the pressure differential between the compressor suction and the compressor discharge, wherein the pressure equalization valve comprises a bypass passage connecting the compressor suction to the compressor discharge to enable the compressor to be bypassed and a valve to control flow of refrigerant through the bypass passage;
a liquid valve arranged in a flow line between the heat rejecting heat exchanger and the expansion valve;
a heating means for heating at least one component of the compressor; and
a control means for activating the heating means when it is determined that compressor-startup is required, the control means starting the compressor after heating the at least one component, the liquid valve being closed for at least a portion of the heating the at least one component.

REJECTIONS

Claims 1 and 4 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jung (US 2005/0252223 A1, pub. Nov. 17, 2005), Tipton (US 6,490,882 B2, iss. Dec. 10, 2002), and Dudley (US 6,886,354 B2, iss. May 3, 2005).

ANALYSIS

Claims 1 and 4 as being indefinite

The Examiner rejected claim 1 because it was unclear whether the "control means for activating" invokes the provisions of 35 U.S.C. § 112, sixth paragraph. Final Act. 4. The Examiner found that the "control means" is coupled with the functional limitation "activating" without also reciting sufficient structure to achieve the function. *Id.* The Examiner also found that the generic placeholder "control means" is not preceded by a structural modifier. *Id.* The Examiner directed that Appellants either amend claim 1 to recite a "means for" or "step for" modified by functional language, but not also modified by sufficient structure, material, or acts to perform the claimed function, or provide a showing that the current claim language does not recite sufficient structure, material, or acts for performing the claimed function to preclude application of 35 U.S.C. § 112, sixth paragraph. *Id.*

Appellants argue that this limitation already uses the language "means for" and the term "control" does not recite any structural elements and can be deleted from the claim to render the rejection moot. Br. 3–4. Appellants assert that they have no objection to the "control means" limitation being construed under 35 U.S.C. § 112, sixth paragraph.

The Examiner and Appellants both appear to agree that the claimed "control means for activating the heating means" does not recite sufficient structure to achieve that function. Final Act. 4. We agree that this limitation does not recite sufficient structure to overcome the presumption that the "control *means* for activating the heating means" should be interpreted as a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph.

Thus, we do not sustain this rejection.

Claims 1 and 4 as unpatentable over Jung, Tipton, and Dudley

The Examiner found that Jung discloses a refrigeration system, as recited in claim 1, except for the claimed liquid valve and heating means for heating at least one component of the compressor. Final Act. 5–6. The Examiner found that Tipton discloses a liquid valve 170 arranged in a flow line 116 between a heat rejecting heat exchanger 130 and expansion valve 180, and a heating means that heats a compressor oil sump during off cycles of a compressor 120. *Id.* at 6. The Examiner determined that it would have been obvious to include these components in Jung to prevent the refrigerant medium from flowing from the high pressure side of the refrigerating circuit to the low pressure side and to prevent dangerous high pressure excursion incidents in the discharge lines, as taught by Tipton. *Id.*

The Examiner also found that Jung, as modified by Tipton, still lacks a control means for activating the heating means when it is determined that the compressor startup is required and starting the compressor after heating the at least one component. *Id.* The Examiner found that Dudley teaches a control means (microprocessor 30) for activating heating means (crankcase heater 11) when it is determined that compressor startup is required (e.g., if liquid refrigerant is sensed in compressor prior to startup, crankcase heater 11 is activated to evaporate liquid refrigerant at the suction of compressor, and then microprocessor starts compressor 10 after heating the at least one component), as claimed. *Id.* at 6–7. The Examiner determined that it would have been obvious to use Dudley's control means in the modified system of Jung to protect the compressor by detecting and controlling the amount of liquid refrigerant present in the compressor, as taught by Dudley. *Id.* at 7.

Appellants' individual attacks on the references (Br. 5–6) are not persuasive of error in the Examiner's determination of obviousness. Appellants argue that Tipton discloses the claimed liquid valve and heating means, but not the claimed operation of these components such as the liquid valve being closed for at least a portion of the heating of the component. *Id.* at 5. Appellants argue that Tipton's heater 122 is used during "off" cycles rather than when compressor startup is required, and Tipton's liquid valve 170 is closed during off cycles rather than when compressor startup is required. *Id.* Appellants also argue that Dudley lacks a liquid valve and the claimed interaction between heating and closing the valve. *Id.* at 5–6.

These arguments are not persuasive because the Examiner relies on Tipton to teach a liquid valve and heating means, and also closing the liquid valve during heating. Final Act. 6. Appellants admit that Tipton discloses a liquid valve and heating means. *See* Br. 5. Tipton also teaches the claimed function of closing liquid valve 170 during at least a portion of the heating of the compressor oil sump, i.e., during an "off" cycle. *See* Tipton, 4:47–50, 5:1–4, Fig. 2; Final Act. 6; Ans. 9–11. Liquid valve 170 is closed during the "off" cycles of the compressor, *and* compressor heater 122 also heats the oil sump during "off" cycles. Tipton, 4:47–50, 5:1–4. Liquid valve 170 thus prevents refrigerant migration to compressor 120, and heater 122 prevents refrigerant condensation in the compressor. *Id.* at 6:25–49, 5:2–4, 2:4–47.

Dudley teaches a control sequence that protects the compressor by activating crankcase heater 11 when a request for startup is received and then starting the compressor after heating of the compressor has evaporated liquid at suction inlet 22 of compressor 10 (i.e., a compressor component). Dudley, 2:1–11, 3:55–67, 4:33–67, Figs. 5, 6; Final Act. 6–7; Ans. 12–14.

Like Tipton, Dudley teaches a control means that activates a heater during an "off" cycle, i.e., before a compressor is activated. Dudley, Fig. 6 (step 101). When Dudley's control means (microprocessor 30) receives a request for cooling, i.e., a request to activate the system, microprocessor 30 initiates a startup procedure that checks for liquid refrigerant in compressor 10 and activates crankcase heater 11 if liquid (i.e., refrigerant) is sensed in compressor 10. *Id.* at 4:33–67, Fig. 6 (steps 102, 103, 105). After heating the compressor 112 to evaporate liquid refrigerant, microprocessor 30 starts the compressor if liquid is not sensed in the suction inlet and sufficient oil is sensed in the compressor sump 10. *Id.*, Fig. 6 (step 112). Dudley thus teaches a control means that activates a heating means when compressor startup is required and starts the compressor after heating of the compressor.

In sum, Tipton teaches a liquid valve that is closed during heating of a compressor, and Dudley teaches such heating as part of a startup procedure. The Examiner's reasons for combining these teachings are supported by the teachings in the references of the advantages of these features, and therefore are supported by rational underpinnings. Final Act. 6–7; Ans. 9–14.

Thus, we sustain the rejection of claim 1 and dependent claim 4 where Appellant does not present separate arguments for claim 4. Br. 3–6.

DECISION

We reverse the rejection of claims 1 and 4 for indefiniteness, and we affirm the rejection of claims 1 and 4 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED